

BIOCHEMISTRY 1 COURSE SPECIFICATION

2016-2017

University: Assiut

Faculty: Medicine

Department: Medical BIOCHEMISTRY

1- Basic Course information

Course title: Biochemistry 1 **Code:** Amed05

Academic year / Level: First year

Programme(s) on which the course is given: M.B.B.Ch. program

Department offering the course: Department of medical Biochemistry

Lecture: 75 hours

Tutorial/practical: 60 hours

Total: 135 hours

Date of specification approval: 9/ 2016

Date of last revision: 9-2016

2 -Overall aims:

- To provide the students with the basic knowledge about :
Micro- and macromolecules of carbohydrates, lipids, proteins, nucleotides and nucleic acids (the major components of living cells)
- To provide the students with the basic principles of Molecular biology and Protein synthesis
- To provide the students with the basic knowledge about biochemistry of vitamins, and enzymes
- To provide the students with the basic knowledge about biochemistry of the hemoglobin , free radicals and antioxidants.
- To provide the students with the basic knowledge about principles of immunochemistry.
- To enable the development and application of biochemical techniques and maintaining the body health

3- Intended learning outcomes (ILOs):

a- Knowledge and understanding

By the end of the course, students should be able to:

A1- Mention the importance, chemical structure and classification of carbohydrates, lipids, and proteins (A6, A7, A20)

- A2- Describe the mode of action and kinetics of enzymes and their role in the diagnosis of diseases (A7, A8, A9, A20)
- A3- Illustrate structure and role of vitamins as coenzymes and point out diseases produced by vitamins deficiency (A7, A8, A9, A20)
- A4- Mention the importance and biochemistry of physiological buffers and some physicochemical processes, radioisotopes and their role in medicine. (A6, A7, A8, A20)
- A5- Describe nucleotides, nucleic acids and gene concept (A6, A7, A20)
- A6- Describe DNA replication, transcription and post transcriptional modification of RNA. (A6, A7, A20)
- A7- Define genetic code, its characters and protein synthesis (A6, A7, A20)
- A8- Describe regulation of gene expression and mutation (A6, A7, A20)
- A9- Describe mechanism of DNA damage, repair and diseases related to defective repair (A8, A9, A20)
- A10- Describe genetic engineering and recombinant DNA techniques, animal and human cloning (A20)
- A11- Describe principles of gene therapy (A20)
- A12- Describe the structure and function of hemoglobin (A6, A7, A8, A9, A20)
- A13- Describe the immune system, structure and types of immunoglobulin (A6, A7, A8, A9)
- A14- Mention the types, sources and effect of free radicals and antioxidants (A6, A7, A8, A9)
- A15- Adopt the principles of lifelong learning.(A20)

B- Intellectual skills

By the end of the course, students should be able to:

- B1-Interpret the biochemical role of the major components of the tissues in maintaining the body health. (B1- B8)
- B2- Interpret the general scheme to reach the correct identification of unknown carbohydrate, lipid and protein solutions (B1)
- B3- Correlate causes, mechanisms and effect of diseases based on knowledge of carbohydrate, protein or lipid biochemistry or molecular biology (B1- B8)
- B4- Interpret different tests for genetic engineering and recombinant DNA technology (B1- B8)
- B5- Outline causes, effects of diseases dependant on knowledge of vitamin and enzyme deficiency. (B1- B8)

C- Practical and professional skills

By the end of the course, students should be able to:

- C1- Examine laboratory reagents and instruments used in biochemistry laboratory. (C2)
- C2- Elicit the physical and chemical properties of carbohydrates (C2, C3)
- C3- Perform chemical tests to study the properties of lipids and proteins (C2, C3, C4)
- C4- Elicit unknown solutions (carbohydrates, lipids or proteins) (C2, C3, C4)

D- General skills

By the end of the course, students should be able to:

- D1- Deliver reports and essay on the different scientific items in the field of biochemistry. (D11, D12)
- D2- Display the biochemical results in printable sheets (D11, D12)
- D3- Share in groups and team in labs (D17)
- D4- Use computer and internet to extract information and knowledge. (D15)
- D5- Apply safety and infection control measures during practice. (D9)
- D6- Recognize and accept limitations in knowledge and clinical skills. (D14)
- D7- Be always responsible in completing his/ her work and coping with changing environment, always striving for excellence. (D13, D14)
- D8- Effectively manage time and resources and set priorities. (D16)

4- Course contents:

Topic	No. of Hours	Lecture	Tutorial/Practical
Physical chemistry	7	3	4
Carbohydrates chemistry	30	10	20
Lipids chemistry	16	12	4
Proteins and nucleoproteins chemistry	32	12	20
Enzymes	10	10	-
Molecular biology	10	10	-
Vitamins	14	10	4
Free radicals and antioxidants	2	2	-
HB chemistry	2	2	-
Immunochemistry	4	4	-
General scheme	8	-	8
Total	135	75	60

5- Teaching and learning Methods:

- 1- Lectures
- 2- Discussion sessions(tutorials) for communication & intellectual skills
- 3- Practical sessions to gain practical skills
- 4- MCQs (formative / summative)
- 5- Assignments and reports
- 6- Student log book.
- 7- E-Learning system interactive discussions.

Teaching and learning facilities:

- 1- Student laboratories.
- 2- Computers and data show
- 3- Student's library updated review books in medical biochemistry and CDs of the course.
- 4- E-Learning

6- Teaching and learning Methods for students with learning difficulties:

- 1- Lectures
- 2- Discussion sessions(tutorials)
- 3- Practical sessions to gain practical skills
- 4- Assignments and reports
- 5- Special low price classes outside the teaching schedule.

7- Student assessment:

- 1- Written exam (long and short essay and MCQ) to assess(A1-A14, B1-B5, D4)
- 2- Practical exam to assess (B2,B5, C1-C4, D1-D3)
- 3- Oral exam to assess (A1-A14, B1-B5).
- 4- Assignments and reports (D1- D5)

B - Assessment schedule

Assessment 1: MCQs (formative/summative) by the end of both the 3rd month and 6th month

Assessment 2 :Mid term exam (formative/summative) in the 4th month

Assessment 3: Final practical examination by the end of the year

Assessment 4:Final written examination by the end of the year

Assessment 5: Final oral examination by the end of the year

Weighing of assessments

Method of assessment	Marks	Percentage of total
Final written examination	75	50%
Final oral examination	30	20%
Final Practical	15	10%
Mid year	30	20%
examination&continuous assessment	150	100%
Total		

8- List of references

1- Course notes:

Department course notes (Lectures and practical)

2- Essential books:

Department notes

3- Recommended books:

- Harpers Illustrated Biochemistry (30th edition, Published December 18th 2014) by Victor W.Rodwell, David Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil.
- Textbook of Biochemistry with clinical correlations (7th edition, Published January 19th 2010) by Thomas M. Devlin.
- Lippincott's illustrated reviews in Biochemistry (8th edition, Published January 14th 2017): by Denise Ferrier.

4- periodicals, web sites of biochemistry

[http :\\ highwire stanford.edu.](http://highwire.stanford.edu)

[http :\\ www.nln.nib.gov.](http://www.nln.nib.gov)

[http :\\ www.biology arizona .edu \\default.html](http://www.biology.arizona.edu/default.html)

[http :\\ mbc. Harvard. Edu \\biolinks.html](http://mbc.harvard.edu/biolinks.html)

Course coordinator: Prof. Dr. Soad Mohamed Abdel-Ghany

Dr. Sahar El-Deek Mohamed

Dr. Michel EffatFakhry

Head of Department: Prof. Dr. Abd El-RaheemMeki